

UK Patent Application (19) GB (11) 2 342 908 (13) A

(43) Date of A Publication 26.04.2000

(21) Application No 9924599.5

(22) Date of Filing 18.10.1999

(30) Priority Data

(31) 980868

(32) 19.10.1998

(33) IE

(51) INT CL⁷
B65B 23/14 23/10 23/12 23/16, B65G 47/28

(52) UK CL (Edition R)
B8A ACE
B8C C40B1A C40B1D1 C40B1D3
U1S S1813 S1814 S1815

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(56) Documents Cited

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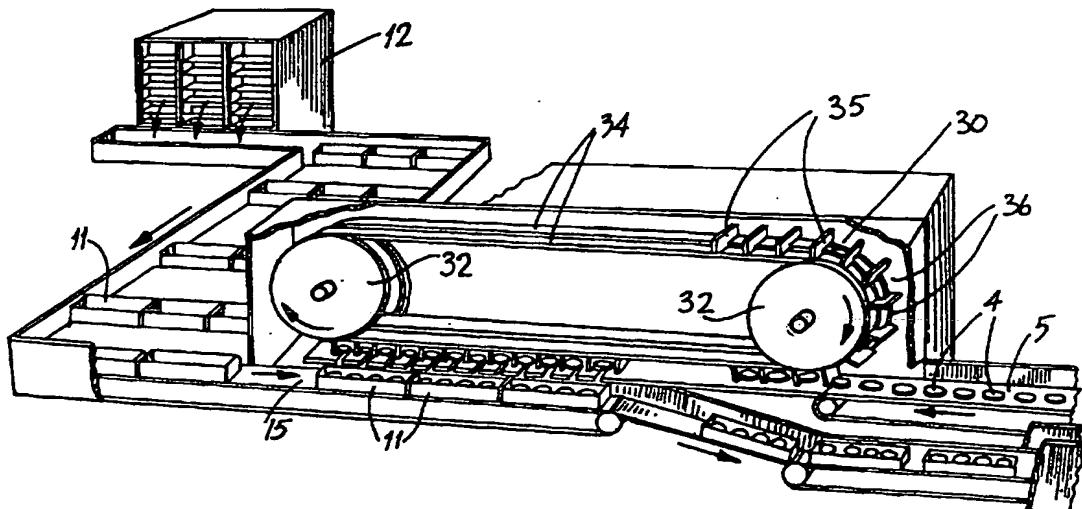
(58) Field of Search

UK CL (Edition R) B8A ACE, B8C CU17 C40B1A
C40B1D1 C40B1D3
INT CL⁷ B65B 23/10 23/12 23/14 23/16 23/18 35/30,
B65G 47/26 47/28
Online: WPI, EPODOC, PAJIO

(54) Abstract Title

A method and apparatus for handling cookies

(57) A method and apparatus for handling cookies in which the cookies 4 are laid flat and arranged into single file, then batched together to form groups which are spaced apart to correspond with pockets in a pack 11 before delivering the flat laid cookies into the pockets in the pack. The grouping means may be a grouping chain 30 having a plurality of projections 35 which engage between adjacent cookies. The projections may be grouped together to provide, for example, grouping of flat laid cookies for delivery into three adjacent packs 11 in a flat laid orientation. Two or more separate groups of projections may be provided. The means of delivering the cookies into the pockets may comprise cookie engaging ejector fingers (50, fig.6). The means for arranging the cookies into single file can be lane reducing means. The apparatus can include tray pack delivery means 12 for delivery of a single line of packs.



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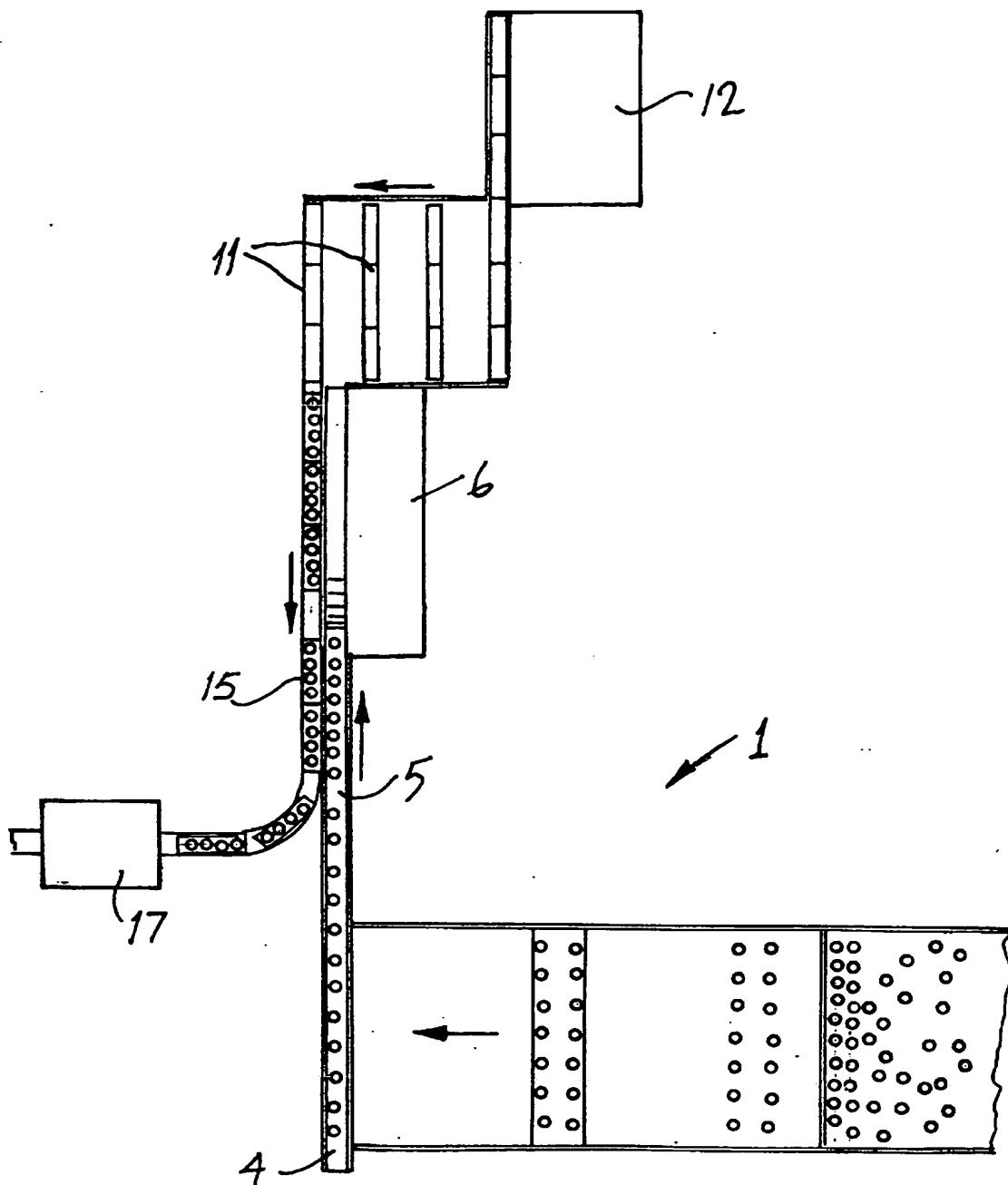
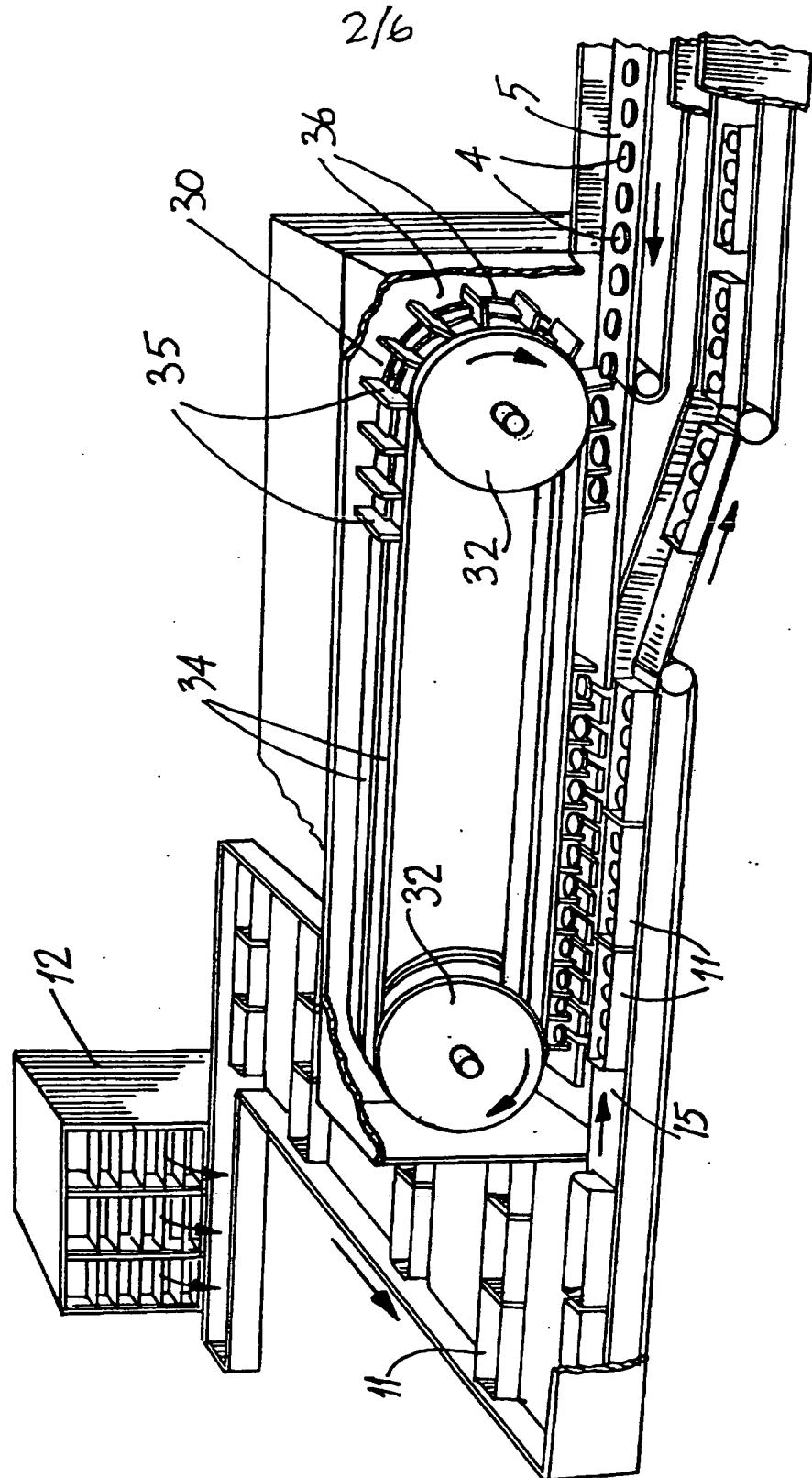


Fig. 1

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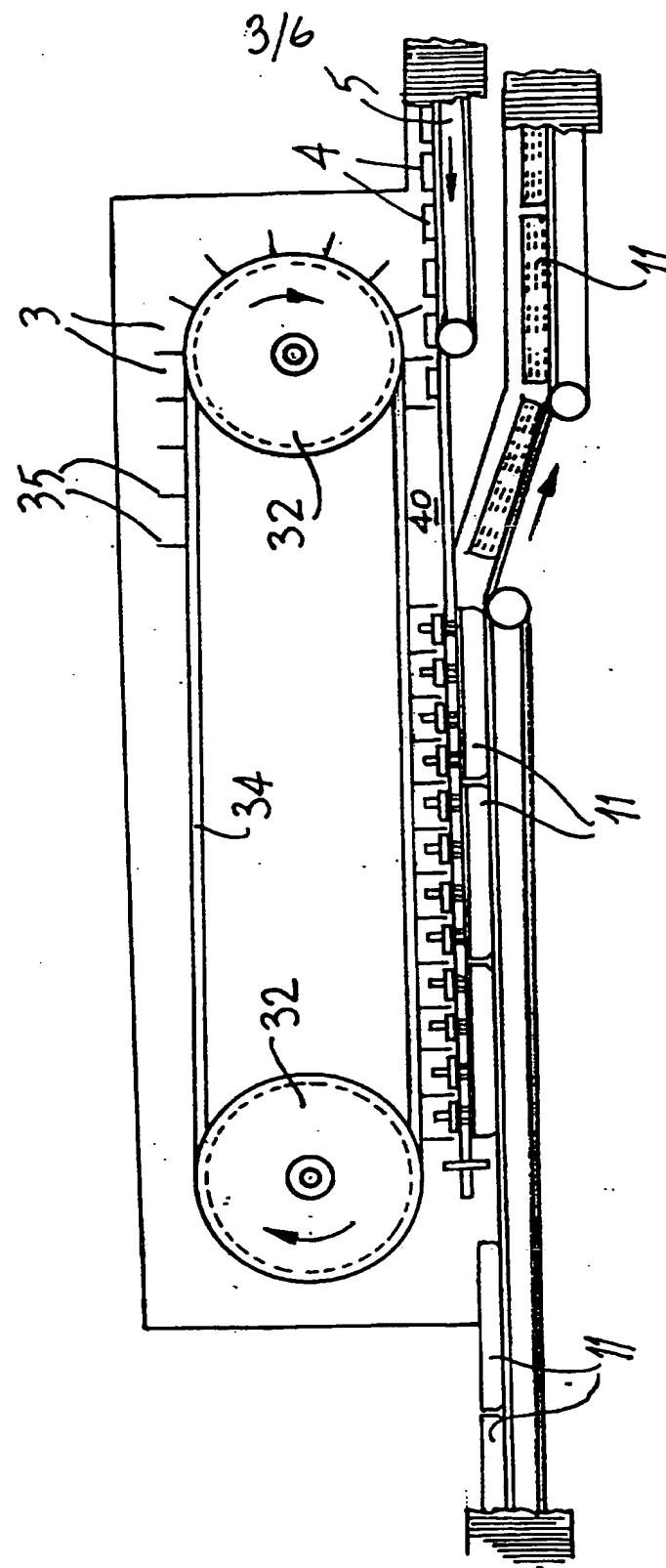


Fig. 3

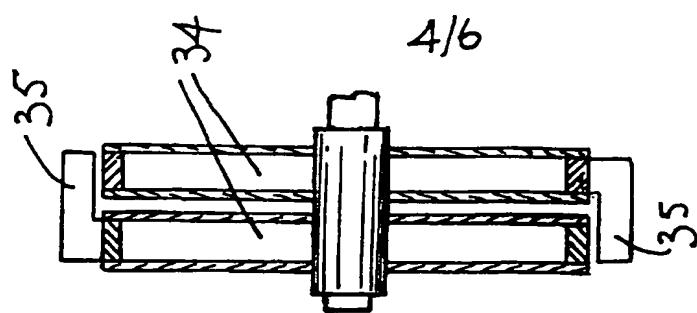


Fig. 5

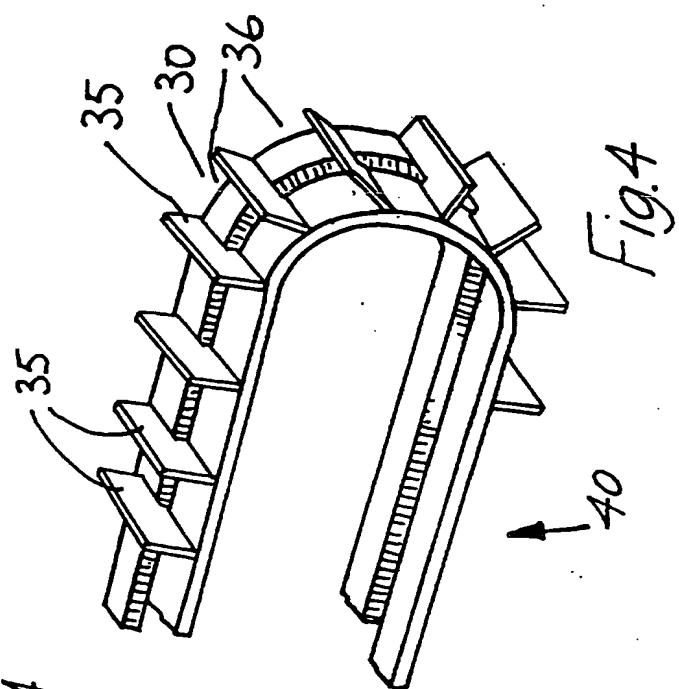
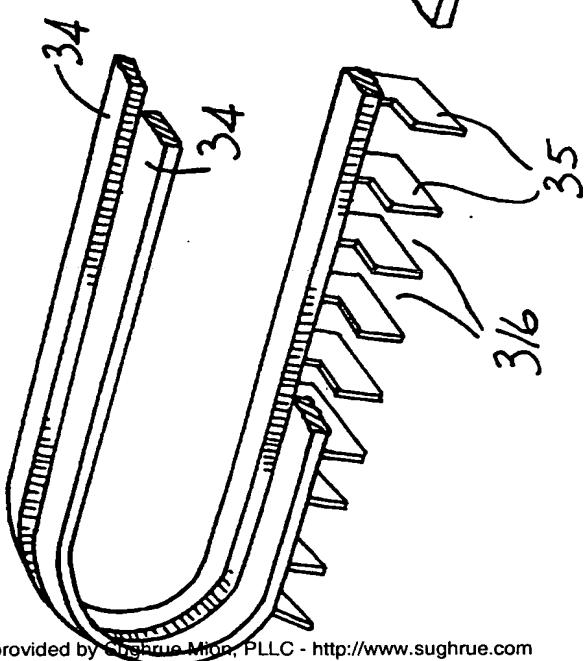


Fig. 4



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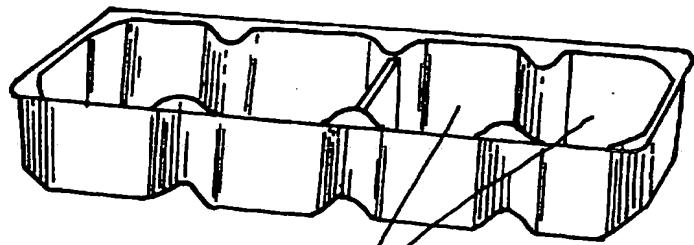
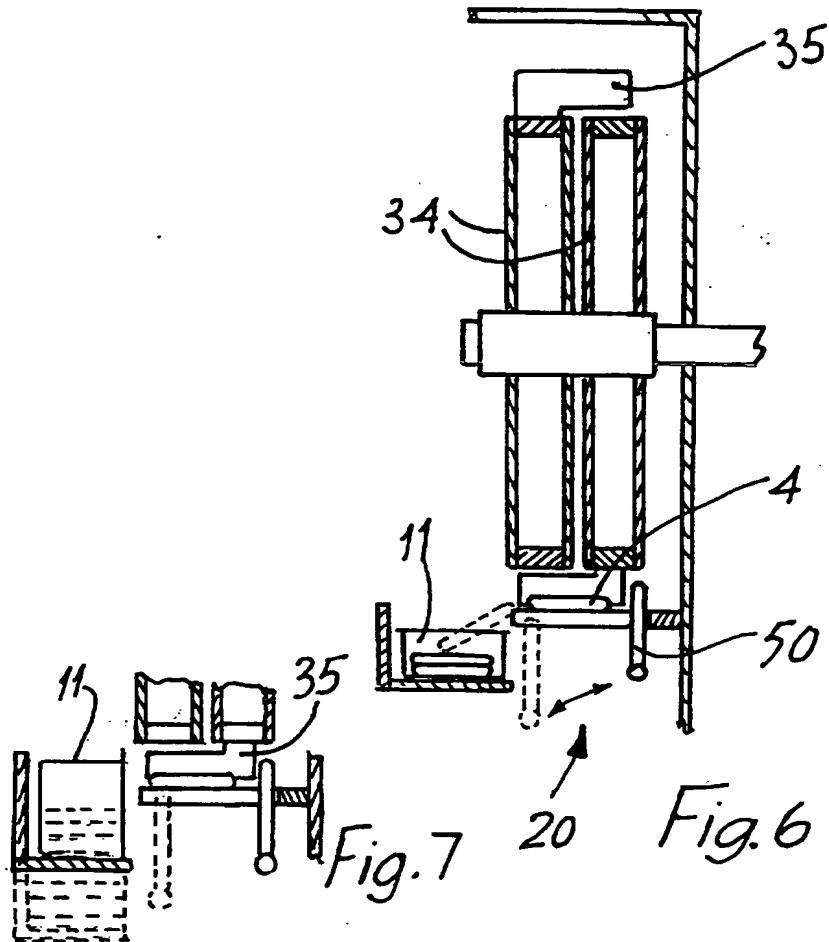


Fig. 8

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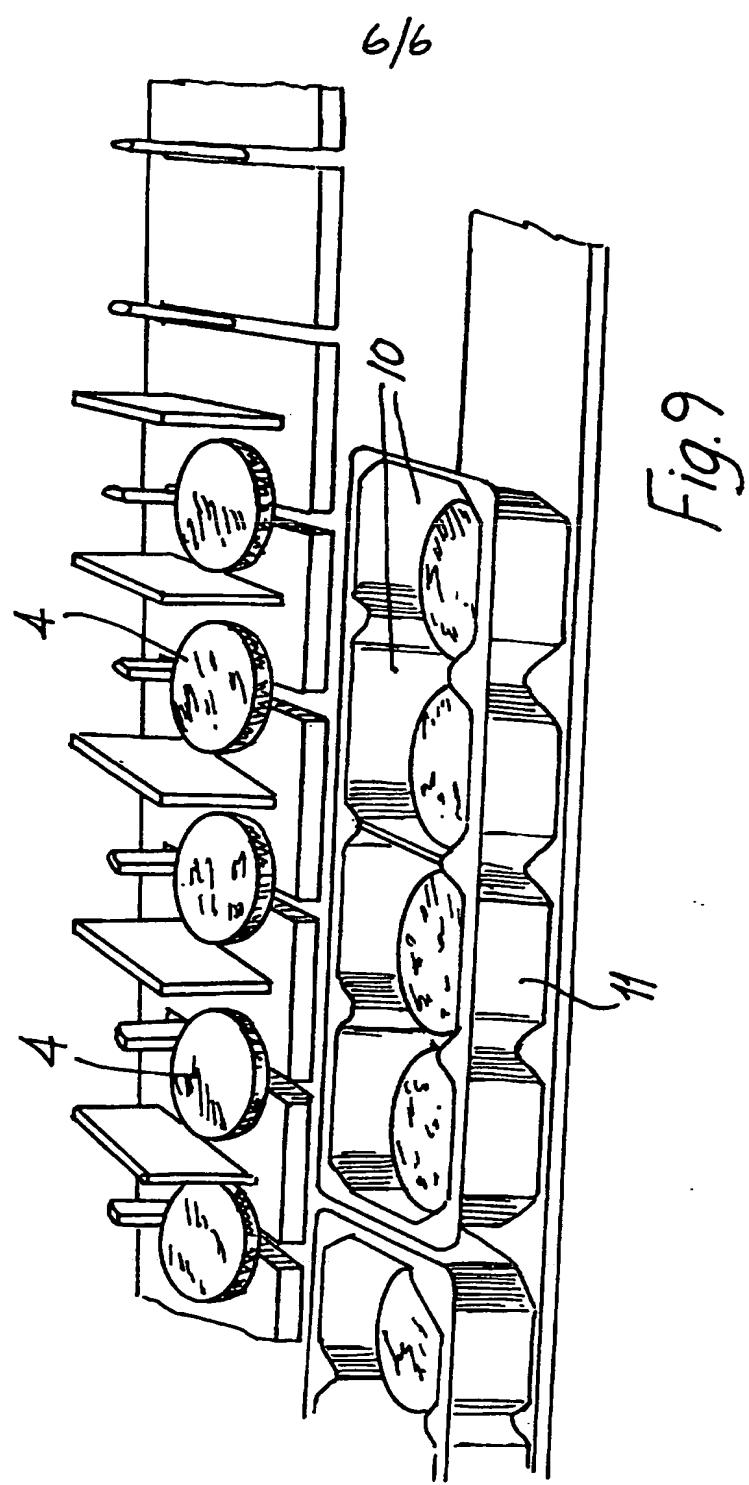


Fig. 9

"A METHOD AND APPARATUS FOR HANDLING COOKIES"Introduction

5 The invention relates to a method and apparatus for handling cookies and especially to a method and apparatus for delivering cookies into individual pockets in a cookie pack.

10 Cookies are generally superior quality biscuits which contain, for example, chocolate chips and the like. They are generally lighter and more delicate than more conventional biscuits. Therefore, to avoid damage in the distribution and delivery of the packs to the consumer they are usually packed into packs with individual pockets for receiving one or more cookies. The pockets are reinforced to prevent damage to the cookies in handling and transit.

15 It is, however, not practical to package cookies into such trays as such packaging is extremely labour intensive and has large reject rates.

20 This invention is therefore directed towards the handling and packaging of cookies which will overcome at least some of these problems.

Statements of the Invention

25 According to the invention there is provided a method for handling cookies comprising the steps of: -

arranging a plurality of cookies into a single file in which the cookies are laid flat;

grouping a number of the flat laid cookies together to form a group of flat laid cookies which are spaced-apart to correspond with pockets in a pack to receive the flat laid cookies; and

5 delivering the group of flat laid cookies into a package, each cookie being delivered into an associated pocket in the pack in which the cookies are laid flat.

10 In one embodiment of the invention cookies are grouped together to form a group of cookies for pack loading by a grouping means having projections which engage between individual cookies in a file to space the cookies apart a desired distance corresponding to the pockets in a pack. Preferably the grouping means is a grouping chain. The grouping chain preferably has a number of groups of projections corresponding to a pack to be loaded. Ideally, the groups of projections are spaced-apart to deliver the groups of cookies in a controlled manner.

15 In another aspect a group of cookies are delivered into a pack by a delivery means which is movable from a retracted position to receive a group of cookies to a delivery position in which the group of cookies are delivered into a pack in which the cookies are laid flat. Preferably the delivery means comprises a number of delivery fingers, the operation of which is co-ordinated to deliver the group cookies into individual pockets in a pack.

20 The invention also provides an apparatus for handling cookies comprising: -

25 means for arranging a plurality of cookies into a single file in which the cookies are laid flat;

grouping means for grouping a number of the laid flat cookies together to form a group of cookies which are spaced-apart to correspond with pockets in a pack to receive the cookies; and

5 delivery means for delivering the group of cookies into a pack in which each cookie is delivered into an associated pocket in the pack in which the cookies are laid flat.

10 In one embodiment of the invention the grouping means has a plurality of projections to engage between individual cookies in a file to space the cookies apart a desired distance corresponding to the pockets in a pack.

15 In a preferred arrangement the grouping means comprises a chain having a number of projections extending therefrom. Preferably the chain has a number of groups of projections which are spaced-apart along the chain. Ideally, each group of projections corresponds to a desired pack or group of packs.

20 In a preferred embodiment of the invention the projections engage between adjacent cookies on a cookie conveyor.

Preferably the cookie delivery means comprises cookie engaging ejector fingers which are movable from a recessed cookie-receiving position to a cookie delivery position to deliver the groups of cookies into pockets in a pack.

25 In one embodiment of the invention the means for arranging a plurality of cookies into a single file comprises a lane reducing means to provide a line of cookies in a single file to the cookie grouping means.

30 Preferably the apparatus includes tray pack delivery means for delivery of a single line of packs to be filled, to the cookie delivery means.

Description of the Drawings

5 The invention shall be more clearly understood from the following description thereof given by way of example only with reference to the accompanying drawings, in which: -

10

Fig. 1 is a plan view of a cookie handling and packaging apparatus according to the invention;

15

Fig. 2 is a perspective, partially cut-away view of part of the apparatus;

Fig. 3 is an elevational view of the apparatus of Fig. 2;

20

Fig. 4 is a perspective view of a grouping chain part of the apparatus;

Fig. 5 is a transverse cross sectional view of the grouping chain;

25

Figs. 6 and 7 are cross sectional views illustrating the operation of the apparatus;

Fig. 8 is a perspective view of a typical tray for receiving cookies; and

Fig. 9 is a perspective view of part of the apparatus on an enlarged scale.

30

Detailed Description

Referring to the drawings there is illustrated method and apparatus for handling and packaging cookies. The apparatus comprises means 1 for arranging a plurality of randomly arranged cookies 2 on a main conveyor 3 into a single file 4

which is delivered along a feed conveyor 5. The apparatus also includes grouping means 6 for grouping a number of the cookies in the single file 4 together on the conveyors to form a group of cookies which are spaced-apart to correspond with pockets 10 in a tray 11 to receive the cookies. A typical tray 11 of this type is 5 illustrated in Fig. 8. Generally a plurality of such empty trays 11 are denested at a denesting station 12 and led along a pack conveyor 15 which runs the trays 11 in a single file to a delivery station 20 at which the group of cookies are loaded into the pockets 10 of the tray 11. On completion of pack loading the packs are wrapped 17, packaged and palletised.

10

The randomly orientated flat laid cookies are arranged in single files by a plurality of rollers arranged across the line of cookies. The rollers are arranged in different groups. For example, there may be thirty two rollers arranged in eight groups of four. Each roller or group of rollers has an independent drive which is 15 electronically controllable to vary and adjust the speed of rotation of the rollers to provide decaying speed motion in a wave pattern. This speed variation of the rollers allows a single line of flat laid cookies to be moved forward from the mass of randomly arranged cookies.

20

The cookies grouping means 6 is illustrated particularly in Figs 2 to 5 and comprises grouping chains 30 attached to belts 34 which are trained around pulley wheels 32. Each grouping chain 30 has a number of radially extending projections 35 to form therebetween pockets 36, each for receiving a single flat laid cookie 2. In this case the projections 35 are grouped together to provide, for 25 example, grouping of flat laid cookies for simultaneous delivery into three adjacent packs 11 in a flat laid orientation as illustrated. Two separate groups of projections are shown in for illustration purposes. A gap 40 between the groups allow the chain 30 to be driven substantially continuously, the gap corresponding to the time required to deliver a leading group of cookies into a pack before 30 delivery of a following group into the same or following packs.

A group of flat laid cookies are delivered from the conveyor 5 into the packs 11 by a delivery means 20 comprising a plurality of fingers 50 which are movable from a cookie engaging position illustrated by full lines in Figs 6 and 7 to deliver a cookie 5 2 into a pocket 10 of a pack 11 in a flat laid orientation. The release position of the fingers 50 is illustrated by interrupted lines and it will be noted that the fingers are moved outwardly and downwardly to quickly clear the delivery station.

10 Thus, the invention provides a method and apparatus for efficiently handling and packing delicate high value cookies with minimal manual intervention at economic rates of production.

The invention is not limited to the embodiments hereinbefore described which may be varied in both construction and detail.

Claims

1. A method for handling cookies comprising the steps of: -

5 arranging a plurality of cookies into a single file in which the
 cookies are laid flat;

10 grouping a number of the flat laid cookies together to form a group
 of flat laid cookies which are spaced-apart to correspond with
 pockets in a pack to receive the flat laid cookies; and

15 delivering the group of flat laid cookies into a package, each cookie
 being delivered into an associated pocket in the pack in which the
 cookies are laid flat.

20 2. A method as claimed in claim 1 wherein cookies are grouped together to
 form a group of cookies for pack loading by a grouping means having
 projections which engage between individual cookies in a file to space the
 cookies apart a desired distance corresponding to the pockets in a pack.

25 3. A method as claimed in claim 2 wherein the grouping means is a grouping
 chain.

4. A method as claimed in claim 3 wherein the grouping chain has a number
25 of groups of projections corresponding to a pack to be loaded.

5. A method as claimed in claim 4 wherein the groups of projections are
 spaced-apart to deliver the groups of cookies in a controlled manner.

6. A method as claimed in any preceding claim wherein a group of flat laid cookies are delivered into a pack by a delivery means which is movable from a retracted position to receive a group of cookies to a delivery position in which the group of cookies are delivered into a pack in which the cookies are laid flat.
5
7. A method as claimed in claim 6 wherein the delivery means comprises a number of delivery fingers, the operation of which is co-ordinated to deliver the group of cookies into individual pockets in a pack.
10
8. A method for handling cookies substantially as hereinbefore described with reference to the accompanying drawings.
15
9. Apparatus for handling cookies comprising: -
means for arranging a plurality of cookies into a single file in which the cookies are laid flat;
20 grouping means for grouping a number of the flat laid cookies together to form a group of cookies which are spaced-apart to correspond with pockets in a pack to receive the cookies; and
25 delivery means for delivering the group of cookies into a pack in which each cookie is delivered into an associated pocket in the pack in which the cookies are laid flat.
10. Apparatus as claimed in claim 9 wherein the grouping means has a plurality of projections to engage between individual cookies in a file to space the cookies apart a desired distance corresponding to the pockets in a pack.
30

11. Apparatus as claimed in claim 10 wherein the grouping means comprises a chain having a number of projections extending therefrom.
- 5 12. Apparatus as claimed in claim 11 wherein the chain has a number of groups of projections which are spaced-apart along the chain.
13. Apparatus as claimed in claim 12 wherein each group of projections corresponds to a desired pack or group of packs.
- 10 14. Apparatus as claimed in any of claims 11 to 13 wherein the projections engage between adjacent cookies on a cookie conveyor.
- 15 15. Apparatus as claimed in any of claims 9 to 14 wherein the cookie delivery means comprises cookie engaging ejector fingers which are movable from a recessed cookie-receiving position to a cookie delivery position to deliver the groups of cookies into pockets in a pack.
- 20 16. Apparatus as claimed in any of claims 9 to 15 wherein the means for arranging a plurality of cookies into a single file comprises a lane reducing means to provide a line of cookies in a single file to the cookie grouping means.
- 25 17. Apparatus as claimed in any of claims 9 to 16 including tray pack delivery means for delivery of a single line of packs to be filled to the cookie delivery means.
18. Apparatus for handling cookies substantially as hereinbefore described with reference to the accompanying drawings.

19. Cookies whenever packaged using a method as claimed in any of claims 1 to 8 and/or an apparatus as claimed in any of claims 9 to 18.



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Application No: GB 9924599.5
Claims searched: 1-19

Examiner: Mark Sexton
Date of search: 19 January 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): B8A ACE, B8C CU17

Int Cl (Ed.7): B65B 23/10,12,14,16,18, 35/30, B65G 47/26, 28

Other: Online: WPI, EPODOC, PAJIO

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
Y	GB 1296728 (SCHWEIZERISCHE INDUSTRIE-GESELLSCHAFT) - see fig.6	1,6,7,9-13, 15-17 & 19
Y	EP 0644119 A1 (KLOCKNER HANSEL) - see whole document, note particularly fig.1, single file conveyor 17.	1,6,7,9-13, 15-17 & 19
Y	EP 0082123 A2 (AKTIEBOLGAT) - see whole document noting the aligning conveyor in fig.1, the grouping means in fig.3 and packages with pockets in fig.4	1, 9, 16 & 19
Y	US 5761883 (PRUETT ET AL.) - see whole document, note especially fig.1, single file cookies 12, grouped on conveyor 36	1, 9, 16 & 19

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.